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The indeterminacy of race: The dilemma of difference in medicine and health care

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Abstract How can researchers use race, as they do now, to conduct health-care studies when its very definition is in question? The belief that race is a social construct without 'biological authenticity' though widely shared across disciplines in social science is not subscribed to by traditional science. Yet with an interdisciplinary approach, the two horns of the social construct/genetics dilemma of race are not mutually exclusive. We can use traditional science to provide a rigorous framework and use a social-science approach so that 'invisible' factors are used to adjust the design of studies on an as-needed basis. One approach is to first observe health-care outcomes and then categorize the outcomes, thus removing genetic differences as racial proxies from the design of the study. From the outcomes, we can then determine if there is a pattern of conceivable racial categories. If needed, we can apply dynamic notions of race to acknowledge bias without prejudice. We can use them constructively to improve outcomes and reduce racial disparities. Another approach is nearly identical but considers race not at all: While analyzing outcomes, we can determine if there are biological differences significant enough to identify classifications of humans. That is, we look for genetic patterns in the outcomes and classify only those patterns. There is no attempt to link those patterns to race.

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> If the racial difference is ignored and all groups or persons are treated similarly, unintended harm may result from the failure to recognize racially correlated factors. Conversely, if differences among groups or persons are recognized and attempts are made to respond to past injustices or special burdens, the effort is likely to reinforce existing

> negative stereotypes that contributed to the emphasis on racial differences in the first place. (King, in Reverby 2000, p. 425)

Introduction

John Dewey, a proponent of the philosophy of American Pragmatism, wrote in the nineteenth and twentieth centuries that the problems of philosophy are not problems of Reality but are problems of men. As such, he suggested philosophical dichotomies are problems for men to overcome (Dewey, 1988b, p. 46).

A philosophical dichotomy that confronts us today is that of race, specifically when applied to health-care studies and outcomes: For some, race is socially constructed; for others, it is genetically determined. How can researchers use race, as they do now, to conduct health-care studies when its very definition is in question? As King suggests in the quotation at the start of this article, both definitions of race can cause harm when used separately, even with the best intentions.

The belief that race is a social construct without "biological authenticity" is widely shared across disciplines in social science (Blauner, 1992, p. 55; King, 1992, p. 94; Gannett, 2001, p. 482). Traditional science, however, has not subscribed to this belief. Medical scientists, researchers, and practitioners currently use the Office of Management and Budget's (OMB's) racial categories at the start of longitudinal studies, throughout medical and clinical trials, and during patient treatment, with little thought of harm. They typically do not consider how the act of categorizing people by race, shaped by our inherent social biases and past histories, might influence study results or treatment recommendations.

Instead, traditional scientific research methodology maintains beliefs in absolute truth, which is visible and discovered through measurement. It does not consider human experience or cultural influences as determinants of the truth. Social science, in contrast, believes in contextual truth, which is created through perception. It considers "invisible" factors such as human experience or cultural influences as determinants of the truth.

This paper seeks to bridge this gap between traditional science and social science. It questions the relevancy of racial categories in genetic research. It argues that logical analysis – which is presumably traditional science's *modus operandi* – entails social, cultural, and political dimensions. Consequently, it argues that we should qualify the value of these dimensions and adjust our study designs accordingly and dynamically, as needed and when needed. By doing so, we may improve medical outcomes and reduce health-care disparities across social groups.

And, now more than ever, there is a demonstrated need to better understand health disparities in U.S. society. We have disparities among men and women's racial/ethnic populations, women's lower socioeconomic classes, rural women's risk factors, and the overall U.S. female population. Current and emerging federal and state policies indicate the need for shared accountability in improving targeted health outcomes on a local and regional level among researchers and policymakers. As public health-related funding decreases at the federal and state levels and racial and ethnic health disparities increase, it is imperative that we pool knowledge resources as well.

In an interdisciplinary approach taken here, the two horns of the social construct/genetics dilemma of race are not mutually exclusive. We can use traditional science to provide a rigorous framework in which to design health-care studies. At the same time, we can use a social-science approach such as John Dewey's American Pragmatism infused with key dimensions of feminist philosophy so that we recognize "invisible" factors and use them to adjust the design of studies on an as-needed basis.

To understand how an interdisciplinary approach can contribute to the current debate about health care, this paper first clarifies the horns of our dilemma by showing how traditional scientific methodology and social science methodology differ. It then explores the epistemological limits in both traditional and social sciences historically and how we might apply Feminist Pragmatism to rectify the shortcomings in both. It tackles the slippery question of how to determine relevance in research. Finally, my contribution to this debate, in this paper, suggests some possible paths we might take toward creative, interdisciplinary approaches to health care.

These paths can be simple. They can include the disregarding of racial categories when designing studies. They can include the viewing of race as just another data point in a study, not as a causal factor. These are just a couple of suggestions.

Obviously, this is just a beginning. Our aim is to encourage further discussion and research into how an interdisciplinary approach might lead to improved medical outcomes for everyone, regardless of race and, by further extension, gender and socioeconomic class.

Philosophical Horns of the Dilemma

Although gender, race, and class have increasingly become fundamental categories of analysis, the manner in which they are used in social science and traditional science differs. Social science suggests that these categories are used to derive objective fact (albeit inappropriately with prejudice). Traditional-science protocols use race, class, and gender to certify objective fact without adequately questioning their derivations.

The traditional-science horn of our dilemma engages a classical (Baconian) view of knowledge: Knowledge is the pursuit of objective facts. Objectivity is both an inherent quality of a fact and a scientist's methodology that entails a value-free epistemological position.

Traditional scientists do not acknowledge that observations of genetic or biological differences rely on hierarchical assumptions of human value. They do not recognize that some of these assumptions have historically led to the oppression of underrepresented populations, such as people of color and women. They believe objectivity can be applied to all people, at all times, and under all circumstances.

Within traditional science, accepted assumptions about the nature of reason, the notion of objectivity, and scientific methodology are rarely open to critique. Frequently ignored are factors such as positivist interpretations of scientific methodology; discoveries of the value dimension of factual claims; connections between dominant discourses and domination; subordination of logical analysis to social, cultural, and political issues; and realignment of theory with practice.[1]

Although the scientific method was revolutionized by a shift from confirmation by proof to refutation, which makes all our scientific knowledge tentative, the traditional-science view of the world strives for uniform, simple, and efficient outcomes. It focuses on characteristics that are considered essential or inherent, which are narrowly functional and simplify the complexity of life forms.

The social-science horn of the dilemma, particularly those in feminist philosophy, believes that truth is a dominant discourse linked to domination. Feminist social science calls attention to the harm that results from particular gender, race, and class beliefs, which determine negative outcomes because they neglect value dimensions in research.

Feminist social scientists focus on what is left out of research because they believe certain factors are not the same for all people, at all times, and under all circumstances. When the invisible is made visible, that which is considered objective can be seen playing an alternative role in a hierarchy of interests, a role that obfuscates a broader significance of difference. The invisibility that results from objectivity camouflages all dimensions of power. To many feminist and pragmatist social scientists, the strength of objectivity lies in its political nature, not its truth.

In general, the strength of traditional science's objectivity lies within its logical formalism. Logical analysis is the means by which something can be deemed true or false. Social science's alternative is to subordinate logical analysis to social, cultural, and political issues, thereby making visible the extent to which these other forces are at work but possibly weakening the integrity of the study design.

Both positions concede that logical structures are helpful – and in most cases vital – because they function as scaffoldings that build toward particular goals. For both traditional scientists and feminist social scientists, logical structures provide a framework within which we can make social, cultural, and political considerations visible because they are always already present. However, social scientists hold that social, cultural, and political considerations construct those same logical structures, whereas traditional scientists do not in most cases.

Epistemological Limits in Science

To understand how this divide between traditional science and social science developed, let us look briefly at the history of science in the United States.

Limits in traditional science

The early prescriptions of the nineteenth century's Scientific Method, established in Europe and consequently adopted into the American experience of experimentation, focused on achieving objectivity by eliminating a wide range of variables in research and practice. As a counterpoint, Charles Peirce, William James, and John Dewey introduced the American Pragmatic strain of philosophy and science in the mid- to late nineteenth century and into the twentieth century. This approach questioned the absolutism of objectivity, which was championed by science, and instead posited the value of contextualized truth or objectivity, which was experienced by many in society.

During Dewey's tenure at the University of Chicago in the early twentieth century, he attempted to integrate science into society through the Laboratory School, an experimental classroom. However, the strict adherence to the possibility of objective truths embedded in the nature of the Scientific Method continued to hold sway. Academic areas of specialization and expertise developed, resulting in different approaches to the nature of knowledge and science. Today, many traditional scientists and many people in the general population believe that a conceptual – albeit workable – notion of objectivity denies the existence of subjectivity.

In general, we have been taught that adherence to a notion of absolute objectivity moves our analyses away from relativistic determinations of truth that bias our conduct, particularly when it comes to research methods and outcomes. Yet, in the genetic research of the early twentieth century, ill-conceived biases used subjective and political priorities in the name of objective methodologies and outcomes. During the 1930s, people in the United States and abroad used worldwide eugenics research to substantiate racist social speculations and reinforce racist beliefs, such as classifying Romas and Jews as “unfit” and forcibly sterilizing people with “undesirable” traits. The research was not solely the result of immoral behavior camouflaged in the name of science at the time. It was also the result of assumptions about race that determined the methodology and the outcomes of that very research.

Even without racist assumptions, we have seen time and again that cultural dimensions (although subjective) have great impact. They influence what research gets funded, what assumptions are acted on, what is observed in that research, and what the interpretations of the research findings are. Some bad science emerges, in part because of unethical motivations but also because of poorly conceived methodologies.

For example, during the Tuskegee syphilis experiment in Alabama between 1932 and 1972 by the U.S. Public Health Service, scientists were predisposed to believe in the inferiority of African-Americans. Because of this, they did not feel the need to provide experiment subjects with informed consent or, in fact, to even provide treatment for the disease.

During the Guatemala syphilis studies in 1946–1948, scientists were predisposed to believe that the population of Guatemalan prisoners and mental health patients were natural vectors for syphilis and of such low moral standing that the scientists purposely infected 696 subjects with the disease to see if penicillin could prevent, as well as cure, the disease.

In the Guatemala studies, scientists believed that the methodologies were objective. However, these methodologies applied to a specific population and were not meant to apply to U.S. whites, including the scientists themselves. In this light, how could they be objective? In particular, Dr. John Cutler, the lead scientist, worked on the initial prejudicial consent guidelines, which recently came to light in the Presidential Commission for the Study of Bioethical Issue’s report titled “*Ethically Impossible*” *STD Research in Guatemala from 1946 to 1948* (Gutmann, 2012, p. 28).

As the Tuskegee and Guatemala examples demonstrate, dimensions of subjective contexts can embed themselves, in tandem with an objective methodology, into any determination.

Limits in social science

In the mid- to late twentieth century as analytic formalism took hold, American Pragmatism played a smaller and more limited role in the development of scientific investigations. During this time, health disparities among various disaffected populations also increased. Rather than address this problem with new research methodologies, however, leading scientists branched out from existing research and hypothesized that poor health was inherently related to poverty as a biological trait.

John Dewey, as the leader of the Pragmatic movement of truth as method, had focused on class, not on race or gender. Truth as method regards "truth" as something we create, given how subjective assumptions influence or determine our methodologies, methods, observations, data collection, and data interpretation. Consequently, a focus on race and class as they relate to health disparities remained open in the late twentieth century for different perspectives. Humanism and feminist social sciences were among those to fill the void, providing fertile ground for examining the link between medical research and public health (Rosser, 1994, p. 16). With strong links to Pragmatism, these areas of expertise extended Dewey's notion that truth is subjective, and that scientific research must account for subjectivity in study designs and recommendations (Ross, 1995, p. 148).

In the 1980s and 1990s, the question emerged: Was the failure to critique objectivity within scientific research just bad scientific practice that we could fix simply by adhering to scientific principles more closely and responsibly? To answer this, philosopher of science Sandra Harding (1986, p. 30; 1991, p.138) and biologist Evelyn Fox Keller (Keller and Longino, 1996) subjected traditional scientific methodology to the critique of objectivity (1). They disrupted a classical notion of knowledge as objective, universal, and value-free. Rather, they analyzed the full extent to which knowledge is entirely linked to privilege within a historical, material, and social set of patriarchal power relations.

Since then, Harding's analysis of what she called "strong" objectivity has been the subject of scientific and philosophical inquiry. Some researchers have reappropriated objectivity, not to connote neutrality or value-free inquiry but to acknowledge unavoidable biases. To these researchers, the notion of objectivity includes harmless and perhaps helpful biases, and it rejects prejudicial biases, both personal and political. This inclusive science requires the identification and broad acknowledgement of bias to determine the degree of relevance toward a more accurate science. Donna Haraway, Alison Jagger, and many others refute a notion that truth or facts are objective and are discovered. Rather, they argue that knowledge incorporates interpretation, subjectivity, emotion, bodies, and self-reflexivity and is, as Dewey would say, constructed through selective interests.[2]

The epistemological and methodological flaw that Dewey pointed us to and that current debates focus on is this: How do we identify inherent racial differences without identifying the context in which those differences are relevant? The debates about the nature of objectivity have brought to light the incomplete nature of scientific methodology (that is, the subjective contexts in which objectivity functions), which in turn has created a need for the overall goal of making a better science.

Well-intentioned but misguided beliefs of a complex social and biological construction of difference have also developed and resulted in questionable studies. For example, Kaufman and Hall (2003, p. 111) trace the origin of a theory that attempts to explain the apparent high incidence of hypertension in African-Americans in comparison with White Americans and Africans. The scientific priority to substantiate a theory of a genetic predisposition has contributed to the tenacity of the Slave Hypothesis to explain the observed retention of salt in African-Americans and lack of retention in Africans.

Kaufman and Hall state, "Locked in a paradigm that favored genetic explanations for black-white disparity, several authors began to formulate a hypothesis that would provide a genetic explanation for the black-black disparity" (2003, p. 112). Although unable to provide sufficient evidence for or against the theory of genetic predisposition, Kaufman and Hall trace the theory's persistence throughout contemporary research publications. The evolutionary hypothesis proposed by W.T. Wilson (among others) of rapid genetic selection during the period of slavery distorts historical evidence given an assumption of innate biological difference among ethnicities. "In the peer-reviewed medical literature, the Slavery Hypothesis continues to be cited frequently as a paradigm for justifying the proposition of innate biological difference in cardiovascular disease risk and treatment efficacy" (2003, p. 115).

This type of reasoning is of particular concern because both women and people of color suffer from applications of theories based on presumptive evidence that is then used as proof of the theory. Kaufman and Hall insist that it is necessary to ask why so many find the hypothesis worthy of receiving the benefit of the doubt in the presence of circular reasoning. The failing health indicators of men and women, who are part of a socioeconomic and ethnic minority, experience this condition disproportionately. In addition, low birth weight and pre-term birth are key indicators in predicting the prevalence of diabetes, hypertension, and coronary artery disease by the time a child reaches middle age.

Both horns of this dilemma – the dogmatic objectivity of traditional science and the relativistic subjectivity of social science – create the very kind of dilemma Dewey suggests we overcome. We need to articulate the epistemological challenges and to accommodate broader and more complete methodologies. Although public health research has been especially innovative, its integration into medical research is limited. Further efforts need to be made between public health education and research methodology and medical education and research methodology.

Removal of limits

Epistemological clarity for genetic researchers is necessary to avoid harm from attributing misguided and inherent causal connections to health disparities, as well as to provide broader treatment benefits. We need to provide an analysis of what relevant biological, genetic, or social difference means to bypass even the unintentional inequities that might result.

We should accept race as always relevant and determine just how relevant it is in different contexts.[3] We should ask to what ends genetic differences are relevant and, perhaps most importantly, to what extent genetic differences are relevant to various and overlapping groups of people.

Race, for the purpose of reducing health and treatment disparities, is a contingent classification, a moving target. As Lisa Gannett states, “Whether races exist or not is a futile question, if ‘nature’ is regarded as the source of a response that would be accepted as definitive” (2005, p. 1246). We should avoid the realist extreme for social and political reasons. Those in privileged positions of power construct knowledge. Knowledge is not revealed in nature in all cases. We should also scientifically argue that the constructivist extreme is essentially false on a genetic or biological level. Context is a given; instead, we should start by asking which context is significantly relevant.

A more accurate science, rather than a more objective science, can result from training in the analysis of the epistemological dimensions of knowledge creation, in contrast to training only in knowledge discovery.[4] The good intentions of scientists practicing with an incomplete notion of objectivity can result in great harm. When we see the range of health disparities across race, class, and gender in the United States, good intentions and better social justice practices can no longer factor into a more complete notion of success. A Feminist Pragmatic epistemological component to scientific inquiry is necessary.

Feminist Pragmatic Approach to Health Care

Feminist Pragmatic-based scientific methodologies require that we monitor lives so that we can specify the benefits and harms done to people excluded from the study group, in addition to those who *are* included. Research is not completed when we accumulate the tallied results. Our methodology must make a reflexive critique of the research problem: How are we framing the hypothesis? What are we counting as evidence for or against our hypothesis? What facts are we noting and how are we interpreting them? How are we collecting data and how are we determining significance? How are we articulating each conclusion? We must monitor all these through a lens that extends far beyond what traditionally would be considered statistically significant or scientifically relevant.

Consequently, we are starting to move away from each horn of our dilemma: The noncontextualized reality of difference in traditional-science research, and the radically relativized or individualistic notion of difference in social-science disciplines. We must continue to move toward emergent goal-oriented contexts that lie within the indeterminacy of both social and biological degrees of cohesiveness. In other words, relevant contexts emerge, but they emerge from within indeterminate circumstances and where the biological and the social have interdependent meanings. Although not exclusive to the territory of the feminist pragmatic approach, as many strands in social science thinking and methods development over recent decades have contributed to this perspective, a feminist approach, in particular, articulates the danger of any biological determinism that oppresses women and people of color. In addition, since feminist thought recognizes that race and gender are categories of analysis in scientific methodology, it would mean that everyone else would have to be accounted for given that the consideration of women and people of color would necessitate the challenge of all the consequences of oppression.

Accumulation of experiences

The mainstay of feminist philosophy emphasizes concrete experience (Harding, 1986, p. 30; 1991, p. 105; Rosser, 1994) and the mainstay of American Pragmatism's scientific methodology emphasizes the importance of a context of inquiry (Dewey, 1984a, p. 3). Harding considers objectivity as the accumulation of lived experiences; objectivity is not the separation from all experience. And, Dewey gives little weight to "truth" outside of any particular context, that is, in the universal sense. Rather, truth represents something that "works" because it is in a particular context and is directed to a particular goal. The challenge is to identify the particular context, determine how that context directs the goal, and adjust the context (that is, make the context relevant to determine a particular *equitable* goal). The benefit of *truth* stands in contrast to what can be considered *false,* which is something that does not work for a particular equitable purpose. Adopting a Feminist Pragmatic approach to truth allows perspectives to accumulate, ensuring greater equity in representation and hence greater accuracy, rather than a limiting of perspective.

Overall, the Feminist Pragmatic approach incorporates a broad conceptual analysis and experimental, qualitative, and quantitative methods that address scientific outcomes from within the contexts of a variety of specific peoples' lives. Predetermined guidelines for racial categories within scientific studies are inaccurate because they are misleading and tend to include some people who wouldn't otherwise belong in a category and exclude those who perhaps should be included.

The Feminist Pragmatist goal of discovering the value (social and cultural) dimension of factual claims helps scientists do two things: (1) They can use a value dimension to attest to the validity of facts, and (2) they can use a value dimension to determine how these facts came to be considered facts in the first place.

How facts are selected and how we become aware of certain facts and not others is not just the result of our awareness of different perspectives. Indeed, there are facts that exist solely as a result of holding a perspective, and there are other facts that exist outside of any perspective. Adding the value dimension as a source of factual claims requires that we avoid the claim that someone else's facts are not facts simply because they are the subject of a particular perspective (Tompkins, 2002, p. 733).

Thus, the Feminist Pragmatist's notion of objectivity is broadened from the realist's (genetics) horn. Instead, the addition of the value dimension gives rise to an evaluation of the way beliefs are grounded, which in turn gives way to the reasons, evidence, and authorities used to establish facts (Peirce, 1940, p. 5, 1987; James, 1904, p. 533, 1976). The logical formalism of facts is maintained and incorporated into the constructivist's (social construct) horn.

Effect of context

The value of Pragmatism is its alternate notion of truth as well as the incorporation of a logic of inquiry. Because truths are subjective and purposive, individual truths are forms of propositional data, and we use them as knowledge to direct future action. These "truths" reflect selective choices within a particular historical context. Propositional data are a necessary but insufficient condition of various forms of knowledge (Dewey, 1988a, p. 168). Propositional data do not constitute knowledge; the conditions of knowledge involve method as well as truth and selective interests forge the link between truth and method. "Selective interest, the concerns or attitude of a subject, is not the subject matter of reflection but rather determines or selects the actual subject matter of reflection. … Philosophy of experience arises from within experience itself, from selective interests within a background" (Stuhr, 1987, p. 329).

Knowledge is not about truth or fact as an independent entity. It occurs as a consequence of a particular method of inquiry. We recognize facts and sort them by way of our selective interests. This inquiry occurs within a particular or generalized context; consequently, methodology and method are linked to the context in which selective interests function. If we, as academics and scientists, fail to recognize the role of selective interests in context as part and parcel of a methodology, we also fail as academics and scientists. As Dewey admonishes, "Neglect of specific acknowledgement of it [context] is, then, too readily converted into its virtual denial" (1984a, p. 6). We must be self-reflective enough to recognize that we think and discover facts within an inherited background.

Context of Group Membership

For centuries, researchers have used our inherited background of the distinction by race in unjust and inadequate manners motivated by the fear of human difference as well as partisan political interests. They have long denied the political dimensions of scientific discovery. Some people wielded control over other people both intentionally and unintentionally as a means to control social interactions. And as western beliefs of rational differences among individuals persisted within natural philosophy, they substantiated natural philosophy in modern science. Scientific advancements substantiated distinctions by race by broadening philosophical and social inquiries into scientific, technological, and medical certifications.

We continue to distinguish by race in medical research and practice, yet we struggle to analyze how the legacy of race concepts informs current practice. In spite of good intentions, the legacy has produced disproportionate and damaging health consequences. An examination of methodological contexts shows that a portion of the damaging legacy lingers in the ontological and metaphorical transfer of meaning in group membership and race theories around the belief of a unity of shared substance.

Blood as "Shared substance"

Originally coined in the 1930s to identify Native Americans, *blood quantum* refers to describing the degree of ancestry for an individual of a specific racial or ethnic group. It represented a biological belief of blood kinship, where the degree of ancestry for an individual of a specific racial or ethnic group could be traced to blood. In time, researchers applied the theory to other races. For example, if a person was of Black African ancestry, the blood quantum theory was referred to as the *one-drop rule*. In Nazi Germany, blood quantum was referred to as the *racial policy* for otherness.

Josephine Johnston uses a case study that exhibits the complexity of group membership and identity when sociological problems are interpreted as scientific problems:

> Descendants of former slaves who came to live among the Seminole Indians of Florida in the seventeenth and eighteenth centuries, the black Seminoles have been officially recognized by the U.S. government as members of the Seminole Nation of Oklahoma since 1866. Two of the fourteen bands within the Nation are composed of Freedmen, as the black Seminoles of Oklahoma are known, and up until the 2000 referendum these bands maintained an active role in Nation politics. The status of the constitutional change is not fully resolved, but if the change were to be implemented, many of the Freedmen would be stripped of their tribal membership and risk losing a significant aspect of their collective identity – all because they cannot show possession of American Indian blood. (2003, p. 262)

Genes as "Shared substance"

Camisha Russell worries that an ontological choreography of race has shifted from blood to genes. She explains that as scientific race theory (blood quantum theory) failed, the symbolic use of race as gene replaced race as blood and introduced a new metaphor for an old idea. The move toward blood quantum and genetic testing to establish group membership is based on assumptions of a biological basis for race. This process complicates and often discounts long-held beliefs that a shared history is the criterion of group membership (2010, p. 1).

My suggestion, supported elsewhere, is that medical certifications of race distinctions have been perpetuated by a transformation of sociological belief to scientific fact.

Race genes now have metaphorical weight in the way that race blood used to. As sociologist Robert Carter claims, "In effect, genomics dissolves race categories (by undermining the link between somatic appearance and group) only to reconstitute it at a deeper genetic level (by suggesting that our most significant connections to other human beings lie in our genes)" (2007, p. 554).

However, current genetic testing techniques may not accurately provide the kind of reliable evidence necessary for blood quantum. Johnston's work shows that the sociological consequences of the eighteenth-century political and military population movements of both freed and escaped slaves and

Native Americans (such as the Seminole tribe) have necessitated the development of a format to finalize economic entitlements.

The very predictability of any set of genes for race is questionable. One would think that the very nature of the indeterminacy of genes would provide enough supporting evidence to dissolve the metaphorical, let alone the biological, association between blood and genes, just as the belief in the unity of substance has been abandoned. However, race categories have appeared as a new truth about human identity. Race is substantiated in fact rather than in belief, and this substantiation makes unethical considerations invisible in most methodological examinations.

Population genetics

Lisa Gannett also raises the issue of the invisibility of a value dimension. She claims the transference of racist assumptions from one set of research approaches to another does not eliminate the racism:

> The prevailing historical understanding of race and biology is that “scientific racism” “retreated” in the 1950s when physical anthropology adopted the concepts and methods of population genetics and replaced socially constructed races with biological populations. But this is not quite so. Populations did not replace races. Races were reconceptualized as populations and a “populational” concept of race was substituted for a “typological” one. That genome diversity is statistically distributed across populations of *Homo sapiens* and that biological anthropologists and human population geneticists have embraced “population thinking” offers no guarantee that human genome diversity research will be nonracist. Nor are empirical “facts” that demonstrate “fundamental” biological unity and genetic heterogeneity in *Homo sapiens* sufficient to eliminate biological racism; nor is “population thinking” inherently antiracist. (2001, p. 491)

Population genetics establishes shared genes that are incorrectly used as racial markers. Some genetic tests can establish regions (geography) where ancestors may have come from. Yet, these genetic tests rely on the (faulty) population genetic associations to race (as a population), which involve the circular reasoning of presuming that race can be identified by studying populations and those populations establish group race identity when the existence of genetic race is the very category of investigation.

Embedded assumptions in context

Logic and, in this case, the logic of genetics is not necessarily neutral. The possibility of the presence of embedded assumptions, shown to be unethical, exists within the field of race genetics and disease. Although evolutionary theory distances itself from notions of genetically based differentials in complex disease among U.S. racial/ethnic groups, biologist Joseph Graves claims that these notions are still popular (2011, p. 160).

Philosophers, social scientists, biologists, geneticists, and the general public have been increasingly able to identify the inappropriate methods performed and the "truth" or "facts" claimed by ill-motivated people. However, it has become more difficult to trace the inappropriate use of a method by well-intentioned individuals practicing with mistaken and misdirected tools.

Contributing to the difficulty of tracing the epistemological, methodological, and linguistic limitations in genetic research is the cognitive authority and proprietary knowledge base of genetic research agendas. Such a limitation is found in the research language of the distinction between biological and genetic explanations. The biological can be analyzed as subsuming the social/cultural, but genetics cannot. Genetics is considered purely objective, not subject to interpretation even in the face of evidence that genes are only statistical probabilities. Genetics is somehow "truer" than even the biological.

The distinction between the term *population/Mendelian genetics* and the more current term *molecular genetics* may be misleading. In the online journal *ColorLines,* independent writer Ziba Kashef claims:

> The terms *ancestry* and *genetic diversity* have emerged as alternative ways to describe the differences we know as race. But they may be no more accurate in expressing human genetic variation than traditional racial categories are. Genetic markers attributed to one group or region of the world can be found in others. Whether scientists discuss the variations in terms of geography or ancestry, the impact will be the same: resurrecting race and racial differences as concrete biological fact, encoded deep within our DNA, and confirmed by science. (2007, p. 5)

Health-care disparities that occur as a consequence of scientific conceptual misguidance may be less visible in methodological contextual examinations even without external unjust social practices (such as, unequal access to health care and toxic environmental interactions). Therefore, it is incumbent upon us to take on the conceptual challenges internally.

Pragmatics of Relevant Context

Observation and acceptance of the nature of genes have become all too real. To paraphrase Bruno Latour, genes have "gained in reality" even though the material nature of a gene is simultaneously considered only a statistical correlation (in Hartigan, 2008, p. 167). To a certain extent, we depend on their very sequencing to predict the course of our lives. Barbara Duden, professor of medical history, suggests that the unified substance legacy is perpetuated in spite of evidence that genes are generally considered only statistical correlations (2010, p. 1), which recalls Camisha Russell's claim that an ontological choreography of race has shifted from blood to genes (2010, p. 1). In other words, the uncertainty of statistical correlation is alleviated when uncertainty is inappropriately objectified.

Beyond statistical correlations

If a defect in a gene is founded as a statistical correlation and the individual is objectified into a risk profile, that statistical correlation is turned into a law. This conversion occurs when the self is turned into a cost–benefit analysis.[5] We must ask, then: How can we use genes, as statistical correlations, to reduce health disparities? Identifying a statistical correlation as fact is as incongruous as analyzing genes to predict who might be incarcerated later in life and then enrolling these very people into "at risk" programs early in life as a preventive measure.

Gannett's pragmatism offers an alternative: "Such a framework not only rejects dichotomies between the social and scientific and what is subjective and objective, but supports an approach that is local and context-specific, and attuned to practice in its incorporation of evaluative and normative as well as descriptive dimensions" (Gannett, p. 1239–1240). By adding the evaluative and normative dimensions, Gannett is on the right track toward a broader, more complete, methodology when she proposes the melding of the scientifically descriptive with the socially evaluative and the ethically normative.

Beyond genetics

Joseph Graves also suggests that relevance is neither exclusively found nor measured in genes:

> The largest misconception of this [geographical] approach is that it ignores the fact that isolation by distance explains the vast majority of variation in human allele frequencies[6]… Thus 75% of human allele frequency variation is explained by geographic distance[7] … This means that it is possible to produce the appearance of clustering simply by where one samples genetic variation. Serre and Paabo demonstrated that heterogeneous sampling gave rise to genetic clusters that were biologically meaningless.[8] (2011, p. 146)

In other words, it is possible to produce the appearances of racial groupings by sampling genetic clusters, but these racial groupings are biologically meaningless or of little relevance because they were modeled and reproduced from social racial categories.

DNA differences are not objective. The probability that DNA differences incorporate cultural meanings that attach to human differences is perhaps unquestionable. "DNA differences are conceptualized and categorized within particular contexts of investigation and the contexts of investigation are themselves historically, socially, and culturally situated" (Gannett, 2001, p. 488).

Can we accept and critically assess research on genetics and race without having preconceptions of what race means? Robert Carter suggests not. In *Genes, Genomes, Genealogy: The Return of Scientific Racism?*, he explains, "SNP [single nucleotide–polymorphism] mapping … will produce typologies of difference between 'population groups' and … these will be determined in important ways by conceptions of race" (2007, p. 551). Genetically similar groups may never follow along social conceptions of race – nor should they be thought to.

Nevertheless, the misguided and therefore inappropriate use of race still lies below the surface in the fields of forensics, medical research, and genealogy (Kashef, 2007, p. 2; Duster, 1990, p. 14). That is, "the old question of how to determine somebody's degree of 'whiteness' or 'Indian-ness' may now be recast in terms of molecular genetics," (Carter, 2007, p. 550) particularly in these fields.

Toward a more complete approach

To move beyond the mixed implications of recent knowledge about genomics for race concepts, we must examine our tendency to recognize that "certain inequalities and disparities in health and disease do seem to correlate with populations defined, however hazily, in terms of race or ethnicity" (Carter, 2007, p. 547). We should take note of the difficulty of producing an understanding of what constitutes a relevant relationship between genes and race. To understand the mixed implications of aligning genomics with race concepts, we first need to analyze the social and cultural associations we use.

So, can we use genes at all as placeholders for race? Writer Jonathan Kahn suggests that we can start with genes to attempt to characterize the boundaries of a group. "There may be occasions where race can be productively used even in genetic research, but in such cases it is very important to differentiate between using a racial group to characterize a gene versus using a gene to characterize a racial group" (2011, p. 132).

Race as a social category may have biological consequences, but it is inaccurate to say that race itself is an inherent causal factor. Social categories of race are able to track racial disparities in health outcomes, but, as Kahn quotes from an editorial in *Nature Biotechnology,* “race is simply a poor proxy for … genetic causes of disease or drug response” (Kahn, p. 133).

So, Carter’s proposal may be more accurate: “We would do better finding out who has the relevant genetic variation and who gets the disease and then basing our epidemiological categories on that, rather than starting with race or ethnic categories of disease and seeking correlations between members of these categories and incidence of the disease” (2007, p. 548).

Solution of Relevance

As Lisa Gannett notes:

> If genetic difference is pervasive from individual to individual and the relationship between clinician and patient is individual, then further research into genetic differences is vital to individual health. But if public health is our priority for the overall health of the human population, then research within and between “groups” [is vital as well.] These patterns of distribution of human genome diversity suggest that, to the extent the OMB or some other system of racial and ethnic classification is useful in pharmacogenetics, it will be most so in the contexts in which attention is focused on groups not individuals. (2005, p. 1241)

The enormity of current genetic research does lend credence to the fact that human populations do have geographically based genetic variations. However, linking geographically based genetic variations to race categories is a questionable practice. Joseph Graves questions how geographical variations can be linked to the damaging health differentials in disease in the United States: “What is not clear is why any professional scientist should believe these [emphasis added] genetic variants explain the differentials for complex disease we see in American society” (2011, p. 160). Citing himself, Graves continues, “Graves and [Michael] Rose argue that while human populations do differentiate in the frequency of genetic variants, the evidence associating this variation with the differentials we observe in the prevalence of complex disease is extremely weak” (2011, p. 160). Consequently, the seeming relevance of geographically based genetic variations to some scientific research may have little relevance to the occurrence and frequency of medical diseases.

Furthermore, Graves invokes Ernst Mayr's 1969 and 1974 work on insects to reinforce that even the simplest of racial metaphors cannot be substantiated:

> He [Mayr] did state that of all the phenomena listed as races in the biological literature, the best case for the existence of true biological races in nature are the host races formed by various insect species on different plant species … . In the case of insect host races (which are biological races), one does not need many loci to create races. No one, however, would claim that racial formation in organisms with more complex behavior is this simple (2011, p. 149)."

Graves suggests this metaphoric pattern of racial formation fails at the simplest levels, even in the United States. To suggest that medicine and health care can use race to determine race-based disease presumes that a biological basis for race has been established, when in fact that is the very question under investigation. Furthermore, this suggestion would also imply that "there would have to be a high certainty that individuals within these races would share specific disease-related genes in common that are different from those of other races" (Graves, 2011, p. 152).

So, what is the factor of relevance by which we should group people in research? If we do not need many different loci to create different biological races, and the ability to garner different loci is not the necessary or sufficient condition to establish biological races in humans, grouping by race is not the place to start an investigation of relevance. Consequently, a better place to start an investigation of relevance might be finding out who has the relevant genetic variation and who gets the disease.

As Lisa Gannett describes, the issue is whether a "single authoritative typology of groups can provide theoretical foundations for diverse research agendas, from the history of human evolution to the marketing of pharmaceuticals" (2005, p. 1236). Because the "research context guides the scientist's choice of which genetic markers to use for clustering" and the "marker choice affects clustering results," then "in a given research context, it is not enough that clusters are genetically similar; what is important is that they are genetically similar in the relevant ways" (2005, p. 1236).

Nature has no authoritative response to the question of relevance, nor should we look toward nature as the source of information that we in fact create. "The relevant question about the adequacy of group categories of DNA difference is not simply descriptive but evaluative, that is, whether and how particular group categories work and not whether they are true (in a correspondence sense) … This will depend on the specific purposes for employing group categories of DNA difference" (Gannett, 2005, p. 1240).

A method that does not necessarily start with racial categories coupled with a reflective analysis of shared and individual cognitive contexts in light of the concerns raised here are vital to the awareness, selection, and evaluation of specific purposes that affect how particular group categories work. Relevance as a contingent factor emerges only after a requisite acknowledgement and interrogation of the social and cultural purposes and contexts from which it emerges and rarely in the absence of such an interrogation.

Conclusion

In this paper, I delineated and synthesized some different approaches to research on ethnic/racial disparities. I proposed that we undertake the type of interrogation that John Dewey advises, as part of investigating responsible and imaginative scientific methodologies in health-disparities research. Because methodology directs purposes, and purposes direct methodology, it is impossible to extract one from the other in the name of scientific objectivity. Thus, we must move past the genetic horn of the dichotomy to be responsible and imaginative scientists.

Our practical experiences are political experiences, and separation of methodology from knowledge cannot be our goal. In aspiring to understand the relationship between life and logic, we must understand that knowledge is a consequence of a particular method of inquiry. Likewise, I urge that we move beyond the social-construct horn of the dichotomy and accept that genetic differences can be used in medical research, even if genes are identified and grouped by social bias. However, this is true only with the following caveats:

- We take Dewey's advice and move past the horns of the dilemma by interrogating our method of inquiry.
- The dilemma of whether there is a genetic or biological basis for race is not a matter of truth or fact. We need to use a functional notion of truth and to account for the fluid context of inquiry in which we all create knowledge.
- We engage the complexity of the relationship between methodology and knowledge. That is, we integrate the extent to which discovered knowledge is created and formulated.
- We draw conclusions that may establish patterns of genetic and biological categories of race as a consequence and evaluation of research, not as part of the investigative methodology.

I have also contributed new theoretical knowledge by suggesting a scientific method that does not start with racial categories. Only then can we entertain the following questions: Can we come up with imaginative research methodologies that take our assumptions about racial categories to task? Can we determine why we deem a difference significant or relevant? Can we make correlations between those who have the relevant genetic variation and those who get the disease? Can we maneuver our cognitive habits from either/or dilemmas to more comprehensive integrations? Can we balance multiple shifting and unpredictable variables?

Although efforts now go into developing ethnic/racial classifications through cognitive research, small-scale tests, and large-scale field trials, which invariably contain free text to accommodate those who can't fit into the predesignated categories as well as allocation to categories via self-assignment using census classifications, this categorization process usually takes place before data collection. My suggestion is that *relevance* as a contingent factor must emerge in service of the naming and the choosing of categories after data collection and occur only after an interrogation of the social and cultural purposes and contexts, not before.

About the Author

Jamie P. Ross has been teaching women's studies, philosophy and interdisciplinary studies at Portland State University since 1992. She received her Ph.D. in philosophy and did her undergraduate degree in philosophy at Bryn Mawr College. Her areas of expertise are epistemology and feminist science studies. She has published in the International Journal of Science and Society and a variety of interdisciplinary journals given her interests in the social, political and ethical dimensions of culture and medicine.

Notes

1 Also see Helen Longino's book *Science as Social Knowledge,* Princeton, New York: Princeton University Press, 1990.

2 See Donna Haraway's book *Simians, Cyborgs, and Women: The Reinvention of Nature*. New York: Routledge, 1991, and Alison Jagger's essay "Love and Knowledge: Emotion in Feminist Epistemology." Eds. Sandra Kemp and Judith Squires. *Feminism*. Oxford: Oxford University Press, 1997. 188–193.

3 Marilyn Frye makes a similar claim: Not that sexism occurs when we make sex relevant when it should not be but rather that sex is always relevant, and that sex as always relevant is used in harmful, disadvantaging manners (1983, p. 19).

4 Knowledge creation and knowledge discovery are not mutually exclusive. For example, western notions of practicing preventive medicine entail going to the doctor to catch anything harmful early (for example, a Pap smear to detect early-stage cervical cancer) (Gregg, 2010, p. 1). Vietnamese women were thought not to practice preventive medicine because of the low rate of

Pap smears undergone by Gregg's population of Vietnamese women in Oregon. However, the women themselves reported practicing preventative medicine by monitoring their "humeral" balance and equilibrium. Gregg realized that she needed to merge discovered knowledge (the objective knowledge that viruses can lead to cancer) with created knowledge (the subjective knowledge of preventive practices) and to make a cognitive contextual shift to understand that the low Pap smear rate among this population was not necessarily about the public health issue of clinic access, but about what counts as knowledge.

5 As an informed decision then becomes a contradiction in terms, the concept of self-determination is thereby destroyed. Sylvia Burrows exemplifies the deterioration of informed decision making when the perception of "being at risk" induces a woman to use modes of reproductive technology with the belief that its use will reduce that risk and that reproductive technology is safe and rational (2010, p. 1). Given that women have strong risk aversions, this causes their trust in themselves to decrease, their skills of resistance and resolve to diminish, and their overall autonomy to be undermined.

6 Graves takes this claim from Templeton (2002, p. 31) and Handley *et al* (2007, p. 432).

7 Graves takes this claim from Ramachandran *et al* (2005, p. 15942), Prugnolle *et al* (2005, p. R159), Linz *et al* (2007, p. 915), and Handley *et al* (2007, p. 432).

8 Graves takes this claim from Serre and Paabo (2004, p. 1679).

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